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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,776	11/26/2003	Haixun Wang	YOR920030413US1	7238

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EXAMINER	
BITAR, NANCY	

ART UNIT	PAPER NUMBER
2624	

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12/09/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/722,776	WANG ET AL.	
	Examiner	Art Unit	
	NANCY BITAR	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 August 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 June 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's response to the last Office Action, filed 6/24/2009, has been entered and made of record.

2. Applicant has amended claims 1and 18. , Claims 1-20 are currently pending.

3. Applicant's arguments, in the amendment filed 8/10/2009, with respect to the rejections of claims 1-20 under 35 U.S.C103 (a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Kravec et al (US 7,366,352)

Examiner Notes

4. Examiner cites particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al (Clustering by Pattern Similarity in Large data Sets, ACM SIGMOD' 2002 June 4-6, Madison Wisconsin, USA) in view of Kravec et al (US 7,366,352)

As to claim 1, Wang teaches a method for use in finding near-neighbors in a set of objects comprising the steps of: identifying subspace pattern similarities that the objects in the set exhibit in multi-dimensional spaces (identifying subspace clusters in high-dimensional data sets, section 1.3); and defining subspace correlations between in the set and each of or more remaining objects in the set based on the identified subspace pattern similarities for use in identifying near-neighbor objects. Wang discloses clustering by pattern similarity in large data sets (see abstract), including the further limitation wherein the distance function -comprises the following: given two data objects x an d y, a subspace S, and a dimension k € S, the sequence-based distance between x and y is as follows: 7 dist k, S (x, y) =max i € S (xi-yi)- (xk - yk) (see section 4.1: Pair wise Clustering, column 2, lines 1-7; in order to increase the efficiency of determining the pattern similarity) . While Wang meets a number of the limitations of the claimed invention, as pointed out more fully above, Wang fails to specifically teach the defining subspace correlations between one of the objects in the set and each of or more remaining objects in the set based on the identified subspace pattern similarities for use in identifying near-neighbor objects

Specifically, Kravec et al. teaches a method finding a closest match of each of a plurality of N input patterns relative to a plurality of R reference patterns using a plurality of K processing units comprising: (a) loading a first input pattern into a first processing unit and a second input pattern into a second processing unit; (b) sending one of said R reference patterns as a selected reference pattern to said first and second processing units; (c) calculating a first distance in said first processing unit, said first distance representing a similarity of said selected reference pattern to said first input pattern; (d) calculating a second distance in said second processing unit, said second distance representing a similarity of said selected reference pattern to said second input pattern; (e) saving said first distance as a present minimum first distance and saving a first identification corresponding to said selected reference pattern used to calculate said present minimum first distance if said first distance is smaller than a stored previous present minimum first distance; (f) saving said second distance as a present minimum second distance and saving a second identification corresponding to said selected reference pattern used to calculate said present minimum second distance if said second distance is smaller than a stored previous present minimum second distance; (g) repeating steps (b)-(f) until all of said R reference patterns have been loaded, wherein said present first minimum distance is a final first minimum distance of said first input pattern relative to said R reference patterns and said first identification identifies which of said R reference patterns is a closest match to said first input pattern, and said present second minimum distance is a final second minimum distance of said second input pattern relative to said R reference patterns and said second identification identifies which of said R reference patterns is a closest match to said second input pattern; and sending said first identification from a first selection circuit in said first processing unit to a second selection

circuit in said second processing unit after said R reference patterns have been processed, wherein said first selection circuit selects between said final first minimum distance and said first identification (see figure 2 and column 4 lines 25-50. and abstract). it would have been obvious to one of ordinary skill in the art to identify the near neighbor object using the subspace correlation in Wang method in order to compute a relatively fast and accurate computation to narrow the search quickly thus receiving the most accurate possible solution within the time limit. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claims 2, Kravec et al. teaches the method of claim 1, wherein the identifying step further comprises the step of creating a pattern distance index (figure 2 and column 7 lines 33-column 8 lines 1-30)).

As to claim 3, Wang et al. in view of Kravec et al. Wang et al. teaches the method of claim 1, wherein the multi-dimensional spaces comprise arbitrary spaces (figure 1 and 2).

As to claims 4- 5, Wang et al. teaches the method of claim 4, wherein the subspace dimensionality is an indicator of a degree of similarity between the objects (section 4.1).

As to claim 6, Wang et al. in view of Kravec et al. et al., Wang et al. teaches the method of claim 1, wherein data relating to the objects is static (there is no coherence need to be related by shifting or scaling the objects, section 1.4).

As to claim 8, Wang et al. in view of Kravec et al., Wang et al. teaches the method of claim 1, wherein data relating to the objects comprises gene expression data (the gene expression data are organized as matrices, section 1.2).

As to claims 7 and 9, Wang et al. in view of Kravec et al. Wang et al. teaches the method of claim 1, wherein data relating to the objects comprises synthetic data and dynamic data (synthetic and real life data sets, section 5).

As to claim 10, Wang et al. in view of Kravec et al. Wang. et al. teaches the method of claim 1, wherein identifying the subspace pattern similarities comprises a comparison of any subset of dimensions in the multi-dimensional spaces (section 2).

. As to claims 11- 13, Wang et al. in view of Kravec et al., Wang et al. teaches the method of claim 12, wherein a first pair in the sequence of pairs comprises a base of comparison for one or more remaining pairs in the sequence of pairs (figure 13).

As to claim 14, Wang et al. teaches the method of claim 12, wherein the sequence of pairs is represented sequentially in a tree structure comprising one or more edges and one or more nodes (figure 10).

As to claim 15, Kravec et al. teaches the method of claim 2, wherein creating the pattern distance index comprises use of pattern-distance links (figure 3).

As to claim 16, Wang et al. in view of Aono et al., Wang et al. teaches the method of claim 1, wherein the process is optimized by maintaining a set of embedded ranges (embed random value ranges from 0-500, section 5.1).

Claims 17-20 differ from claim 1 only in that claims 19-20 are program claims whereas, claim 1 is an apparatus claim. Thus, claims 19-20 are analyzed as previously discussed with respect to claims above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NANCY BITAR whose telephone number is (571)270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nancy Bitar/
Examiner, Art Unit 2624

/Wes Tucker/
Primary Examiner, Art Unit 2624